In the Drawing:

Please accept the accompanying new drawing sheet, which illustrates the fluorescence intensity measuring device for performing the method according to the present invention. Entry of the new drawing figure and withdrawal of the objection to the subject matter of the application due to the lack thereof is respectfully requested.

REMARKS

I. ALLOWABLE SUBJECT MATTER

Method claims 16 to 27 were found to be allowable if amended to overcome the rejection under 35 U.S.C. 101. These claims have been amended and it is respectfully submitted that the changes made in the claims have overcome the rejection under 35 U.S.C. 101 as explained further herein below.

Furthermore new method claims 30 to 35 have been added for preferred embodiments of the method claimed in claim 16. These claims should also be allowed because they depend on allowable amended claim 16 or include all its features and limitations.

II. CLAIM CHANGES

The claimed method is a method of testing an optical material to determine whether or not it is suitable for making an optical element, especially for DUV lithography, or alternatively a method of controlling the quality of the optical element. If the optical material has an acceptable ratio of non-intrinsic fluorescence to intrinsic fluorescence, then the optical material may be used to make the optical element. If the ratio does not have an acceptable value, then the optical material cannot be used to make the optical element.

The testing method claims in claims 16 to 27 and 30 to 35 thus saves the

work of making the optical element from the optical material in cases in which the optical element would not have acceptable properties for e.g. DUV photolithography because it was made with an inferior or unacceptable optical material.

Claim 16 has been amended by limiting the optical material tested to crystalline optical material in accordance with page 8, lines 20 to 21, of the applicants' originally filed specification. Dependent claims 18 and 25 have been amended in a similar manner.

Claim 16 has also been amended by adding three new steps to provide a concrete "real world" result. These three new steps have basis in the originally filed claim 2 and in the disclosure in applicants' specification on page 4, lines 9 to 18, where it states that the ratio of non-intrinsic to intrinsic fluorescence can be used to quickly ascertain whether the optical material is suitable for further processing to make an optical element.

New dependent method claim 30 limits the claimed method of claim 16 to using the measuring device of canceled device claim 28 to measure fluorescence intensities. The basis for the subject matter of claim 30 is the same as the basis for canceled claim 28, which is generally the subject matter disclosed on pages 8 and 9 of applicants' specification, especially page 8, line 26, and following.

Claim 31 limits the source of the excitation radiation to a pulsed laser (basis is found on page 6, line 16, of applicants' specification), limits the fluorescence measuring device to a spectrograph with a CCD camera (basis is found on page 9, lines 8 to 14, of the applicants' specification), and limits the

barrier device to a dielectric thin-layer filter (basis is found on page 10, line 6, of applicants' specification).

The embodiment of claim 31 has the special advantage described on page 10, lines 8 to 13, that fluorescence intensities of fluorescence at wavelengths that are close to the wavelengths of the excitation radiation can be measured. It is particularly disadvantageous if an optical element fluoresces at these wavelengths during excitation in DUV photolithograph because the circuit pattern produced is noticeably blurred.

The embodiment of independent method claim 32 limits the optical material tested to alkaline or alkaline earth fluoride monocrystals (the basis for this limitation is found on page 8, line 22, of the applicants' specification). The limitation for the excitation wavelengths to below 200 nm is found on page 6, line 12, of the applicants' specification.

New dependent claims 34 and 35 are dependent method claims that depend on claims 16 and 32 and include subject matter from canceled claim 29.

III. NEW DRAWING FIGURE

The subject matter of the application was found to admit to illustration because of the device claimed in claim 28. Claim 28 has been canceled, but the features of the device claimed in claim 28 have been included in a new dependent method claim 30. For that reason a diagrammatic illustration of the device used to perform the method according to dependent claim 30 has been added on a single new sheet of drawing.

Entry of the new drawing figure and withdrawal of the objection to the subject matter of the application due to a lack of a drawing figure is respectfully requested. No new matter has been added. Basis for the illustration is provided by the disclosure on pages 8 and 9 of the applicants' specification.

IV. SPECIFICATION CHANGES

Some minor spelling and wording errors were corrected in various paragraphs to provide a grammatically correct description on pages 7 to 9 of the applicants' specification. No new matter was entered.

A "Brief Description of the Drawing" section was added to page 8 of the specification, as required by the rules. Drawing reference characters were included in the description of the device following the "Brief Description of the Drawing" section.

V. REJECTION FOR CLAIMING NON-STATUTORY SUBJECT MATTER

Claims 16 to 27 were rejected for claiming non-statutory subject matter.

Method claim 16 has been amended, as described above, so that it now claims statutory subject matter.

Amended method claim 16 claims a method, which is a practical

application of fluorescence intensity measurements of fluorescence bands of an optical material. As such amended method claim 16 complies with the requirements for statutory subject matter in M.P.E.P. 2106 IV. C. 2.

The last step of the amended method claim 16 reads as follows:

"ascertaining whether or not said optical material is suitable for making said optical element according to said amount ratio determined in step e)".

It is respectfully submitted that the last step f) of the amended method claim 16 recites the "useful, concrete, and tangible result" that the claimed method produces.

The claimed method of amended claim 16 is **useful** because it discloses a method of testing a crystalline optical material to determine if it is suitable as a starting material to make an optical element of a required quality. If for example the amount ratio of non-intrinsic fluorescence intensities to intrinsic fluorescence intensities in the total fluorescence spectra were less than a certain predetermined limiting value depending on the particular application of the optical element, then the tested crystalline optical material would be suitable for making the optical element. It is comparatively simple to rapidly measure the amount ratio of fluorescence intensities for a non-intrinsic fluorescence band and an intrinsic fluorescence band with the device described on pages 8 and 9 of applicants' specification. An amount ratio that is too large would signal too many contaminants in the optical material and/or too many crystal inclusions or lattice imperfections, as explained in the background section of the applicants' specification on page 1 of the applicants' specification. If the claimed method shows that the optical material is unsatisfactory for making the optical element,

then other materials can be tested until a suitable material is found for the optical element for the given application. In that way the work involved in making many optical components with different materials and then testing the optical components to determine if they have the appropriate properties for the particular application of that optical component is avoided. This would save money and time so that the result of step f) of claim 16 is useful.

The utility asserted is credible, specific, and substantial. It is **credible** because one skilled in the art knows that many optical components, such as lenses and prisms, are made with crystalline materials. Furthermore one skilled in the art knows that such materials must be comparatively pure and must lack imperfections, for example due to laser pulse damage, which can impair the performance of the optical components. Thus one skilled in the art knows that method of testing samples of crystalline optical materials to determine if they have amounts of impurities and/or too many dislocations and imperfections would be extremely valuable for use in a plant or operation that makes optical components, such as lenses and prisms, from crystalline optical materials.

The result is sufficiently **specific and substantial** because almost any crystalline optical material can be used to make an optical component. Furthermore dependent method claim 25 limits the tested optical materials to various metal fluoride crystals.

Independent method claim 32 is directed to the method of testing the **specific** materials for the optical element used in DUV photolithography. Claim 32 limits the tested crystalline optical materials to alkali halide and alkaline earth

fluoride monocrystals. Method claim 32 also limits the method to excitation radiation in the deep UV and a barrier device for blocking excitation radiation. Dependent claim 33 limits the method of claim 32 to a wavelength-specific filter as barrier device. The features of method claims 32 and 33 are characteristic of DUV photolithography applications, in which it is so very important to avoid fluorescence radiation at wavelengths that are close to those of the deep UV excitation radiation used in DUV photolithography.

The result in the last steps of claims 16 and 32 is **tangible** because it sets forth a practical application of fluorescence measurements (natural phenomenon) that produces a real-world result (knowledge of whether or not a specific crystalline optical material or sample of this optical material can be used to make an optical element or component for a particular application, such as DUV lithography).

The result in the last steps of claims 16 and 32 is **concrete** because it would be repeatable and predictable for the specific materials used for the particular application involved.

See M.P.E.P. 2106 IV. C. 2. (B) (2) section a) to c) and M.P.E.P. 2107.

For the foregoing reasons and because of the changes in the claims withdrawal of the rejection of amended claims 16 to 27 under 35 U.S.C. 101 for claiming non-statutory subject matter is respectfully requested.

Furthermore it is respectfully submitted that none of the new claims 30 to 35 should be rejected under 35 U.S.C. 101.

VI. OTHER REJECTIONS

Optical element claim 29 was rejected under 35 U.S.C. 102 (b) as clearly anticipated by Borelli, et al (WO 98/08775).

Optical element claim 29 has been canceled without replacement. No optical element claims are pending, thus obviating the rejection of the optical element claim 29 as anticipated by Borelli, et al.

Device claim 28 was rejected under 35 U.S.C. 102 (b) as clearly anticipated by Mullaney, et al (US 3,824,402)

Device claim 28 for a device for measuring fluorescence has been canceled without replacement, thus obviating its rejection as anticipated by Mullaney, et al.

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549-4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,

/ Michael J. Striker /

Michael J. Striker,

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